UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/488,858	06/22/2009	Allan Roy Gale	81183068	1450

28395 7590 04/27/2017
BROOKS KUSHMAN P.C./FGTL
1000 TOWN CENTER
22ND FLOOR
SOUTHFIELD, MI 48075-1238

EXAMINER
EVANS, BRYAN A

ART UNIT	PAPER NUMBER
3618	

NOTIFICATION DATE	DELIVERY MODE
04/27/2017	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@brookskushman.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ALLAN ROY GALE, MICHAEL W. DEGNER, and PAUL THEODORE MOMCILOVICH

Appeal 2014-004980
Application 12/488,858
Technology Center 3600

Before BRANDON J. WARNER, LEE L. STEPINA, and RICHARD H. MARSCHALL, *Administrative Patent Judges*.

MARSCHALL, *Administrative Patent Judge*.

DECISION ON APPEAL

Allan Roy Gale et al. (Appellants) seek our review under 35 U.S.C. § 134 of the Examiner's final decision rejecting claims 1–3, 5, 7–16, 18, and 20. Appeal Br. 1. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

THE CLAIMED SUBJECT MATTER

Appellants' claimed subject matter "relates to supplying oil to lubricate and cool components in a hybrid electric vehicle." Spec. 1:7–9. Claims 1, 10, and 18 are independent. Claim 1 is illustrative of the claimed subject matter and is reproduced below.

> 1. A method to control supply in a lubricating oil circuit having a transmission, an electric motor, and a mechanical pump, the method comprising:
>
> controlling a speed of an electric pump coupled to the lubricating oil circuit in response to a desired fluid flow based on a greater of a first oil quantity to provide lubrication to the transmission and a second oil quantity to provide cooling to the electric motor when the mechanical pump is inactive.

Claims App. 1.

THE EVIDENCE

The Examiner relied upon the following prior art references in rejecting the claims on appeal:

O'Sullivan	US 3,163,042	Dec. 29, 1964
Bartolazzi	US 6,213,061 B1	Apr. 10, 2001
Day	US 2009/0111637 A1	Apr. 30, 2009
Kothari	US 2009/0107755 A1	Apr. 30, 2009

THE REJECTIONS

Appellants seek review of the following rejections:

1. Claims 1–3, 5, 7, 18, and 20 under 35 U.S.C. § 103(a) as unpatentable over Day, Kothari, and Bartolazzi.

2. Claims 10–16 under 35 U.S.C. § 103(a) as unpatentable over Kothari and Bartolazzi.
3. Claims 8 and 9 under 35 U.S.C. § 103(a) as unpatentable over Day, Kothari, and O'Sullivan.

ANALYSIS

Independent Claim 1

Regarding claim 1, the Examiner found that Day discloses a method to control the supply of lubricating oil in a circuit, including controlling an electric pump coupled to the circuit in response to a desired flow as claimed. Final Act 2. The Examiner also found that Day does not disclose controlling the speed of an electric pump and operating the pump when the mechanical pump is inactive. *Id.* The Examiner found that Bartolazzi discloses controlling the speed of an electric pump, Kothari discloses operating an electric pump when a mechanical pump is inactive, and determined that it would have been obvious to modify Day to include these aspects of Bartolazzi and Kothari. *Id.* at 2–3.[1] In addition, the Examiner found that

[1] After making findings regarding Day and Bartolazzi, the Examiner determined that it would have been obvious "to modify *Kothari* by further controlling the speed of an electric pump" as disclosed by Bartolazzi. Final Act. 2, ¶ 5 (emphasis added). Because this finding appears directly after the findings regarding Day and Bartolazzi, and prior to any mention of Kothari, we interpret the Examiner's reference to Kothari as an inadvertent error. It is apparent that the Examiner, in paragraph 5 of the Final Office Action, made a determination that it would have been obvious to modify Day rather than Kothari in the manner specified. *See id.*

"meeting a required line pressure" as in Day "inherently meets a required quantity as an increase in pressure results in an increase in flow." Ans. 11.

Appellants make several arguments in relation to the rejection of claim 1, but, for the foregoing reasons, Appellants' arguments do not establish that the Examiner erred in rejecting claim 1. First, Appellants argue that Day fails to disclose a method that "controls an electric pump in response to a desired fluid flow based on the greater of a first oil quantity to provide lubrication to the transmission and a second oil quantity to provide cooling to the electric motor, as required by claim 1." Appeal Br. 6. This argument points to Day's use of monitoring various speeds and a look-up table in its method, but does not address Figure 6 or claims 1 and 4 of Day, which the Examiner relied on in the rejection. *Compare* Appeal Br. 6, *with* Final Act. 2. Day's use of speed data as part of its method, standing alone, does not establish that Day fails to disclose the relevant limitation, and the lack of analysis directed to the evidence relied on by the Examiner similarly does not apprise us of error in the Examiner's rejection.

Second, Appellants argue that, although Kothari may teach operating an auxiliary pump, it does not teach controlling a speed of an electric pump when the mechanical pump is inactive, as required by claim 1. *Id.* at 8. Appellants do not address why Kothari's paragraph 53, relied on by the Examiner, fails to disclose this limitation. Paragraph 53 discloses that "[i]n embodiments where the main hydraulic pump is directly driven [by the engine], and wherein an engine running/engine stopped strategy is employed," the electric pump can be used to supply hydraulic pressure. Kothari ¶ 53; *see also id.* at ¶ 50 (electric pump can be activated in the event

of "power loss of a hydraulic pump"). In our view, Kothari's disclosure adequately supports the Examiner's finding that Kothari discloses operation of the electric pump when the mechanical pump is inactive.

As part of this same argument regarding Kothari, Appellants assert that Kothari selectively enables an electric machine cooling flow based on temperatures and does not teach controlling electric pump speed in response to a desired fluid flow as claimed. Appeal Br. 7–8; *see also* Reply Br. 1–2 (arguing that Kothari fails to teach limitations in claim 1, including providing fluid flow on a comparative basis as required by claim 1). We need not address these arguments because the Examiner did not rely on Kothari as disclosing these limitations in the rejection of claim 1. Final Act. 3. The Examiner relied on Kothari only for teaching operation of the electric pump "when the mechanical pump is inactive" in the rejection of claim 1. *Id.*

Third, Appellants argue that the Examiner failed to supply an adequate rationale for combining Day and Kothari, but Appellants appear to base the argument on the assumption that Day and Kothari disclose a system where "hydraulic fluid always flows" based on the hydraulic pump. Appeal Br. 8. As stated above, Kothari contemplates operation of the system when the hydraulic pump does not supply pressure to the system.[2] Moreover, Day and Kothari both disclose methods of delivering lubricating oil in a circuit using an electric pump. The Examiner concluded that it would have been

[2] This argument may also assume that the Examiner's rejection relies on Kothari as disclosing control of the electric pump speed, but as stated above, we view the reference to Kothari in that sentence of the rejection as a typographical error. *See supra* n.1.

obvious to modify Day to operate the electric pump when the mechanical pump is inactive "in order to ensure that the hydraulic pressure is maintained in the event that the engine has stopped." Final Act. 3. Appellants have not directly addressed this conclusion or suggested that the advantage noted by the Examiner would not be achieved by modifying Day's method with the teaching of Kothari. Under these circumstances, we are not persuaded that the combination of these two closely related references amounts to impermissible hindsight, as Appellants suggest. *See* Appeal Br. 8–9.

Fourth, Appellants allege that "there is no motivation to operate the electric pump of Day and Kothari in the fashion taught by Bartolazzi" because Day and Kothari disclose control in response to line pressure, while Bartolazzi discloses control in response to temperature. *Id.* at 6, 9. As the Examiner points out, the rejection relied on Bartolazzi "merely . . . to teach controlling the speed of the pump in response to a required increase in pumping," not "to teach activating a pump in response to line pressure as this limitation is already disclosed by Day." Ans. 10. We agree with the Examiner that the rejection does not rely upon Bartolazzi's control in response to temperature, and Bartolazzi's reference to temperature does not render its teaching of controlling the speed of the electric pump incompatible with the teachings of Day or Kothari. *See* Final Act. 2.

Fifth, Appellants argue that the Examiner's proposed combination still fails to disclose all of the limitations of the claim because Kothari and Day control in response to line pressure, which "does not inherently meet a required quantity or flow" as required by claim 1. Appeal Br. 9–10. Claim 1 does refer to controlling the electric pump speed "in response to a desired

flow based on a greater of a first oil quantity . . . and a second oil quantity," but the use of "quantity" in the claims must be read in light of the specification to ascertain its meaning. The specification only refers to "quantity" in this context in the Summary section and original claims, but that language merely repeats or paraphrases the claim language. *See* Spec. 2:11–3:14, 15:6–19:1. The Detailed Description portion of the specification also fails to define the term or mention a specific quantity of lubrication needed for various portions of the system. Instead, the specification discusses the use of operating parameters used "to infer flow rate and pressure in the fluid circuit." *Id.* at 8:20–23. The specification also notes that, as part of the determination of lubrication requirements, "sufficient lubrication can be based on pressure in place of flow rate." *Id.* at 9:16–10:4. In short, the specification appears to employ determination of pressure and/or flow rate as indicative of the lubrication amount, or "quantity," required to provide lubrication to system components.

With this backdrop, we are not convinced that Day's method, controlling an electric pump in response to line pressure, fails to address the "quantity" limitation of claim 1 as alleged by Appellants. Appellants do not adequately explain how Day's method would be distinguishable from the teaching in the specification that the claimed quantities, or sufficient lubrication to meet the demands of system components, may be determined using pressure. Similarly, we are not persuaded that the Examiner erred in finding that Day inherently discloses this claim requirement given the similarity in Day's use of the line pressure and the method disclosed in the

specification. *See* Ans. 11 (finding meeting a required line pressure inherently meets a required quantity).

Based on the foregoing, we sustain the rejection of claim 1.

Dependent Claim 2

Claim 2 depends from claim 1 and further requires "commanding the electric pump to provide a shortfall quantity." Claims App. 1. The Examiner relied on Day as modified by Kothari in the rejection of claim 2. Final Act. 3. Appellants argue that Kothari fails to disclose this limitation because "Kothari discloses controlling line pressure" and "[t]here is no disclosure or suggestion of commanding the electric pump to provide a shortfall quantity as claimed." Appeal Br. 11. Appellants' argument relies on the same unpersuasive argument rejected above—that the reference to "quantity" in the claims requires something more than basing the system needs on line pressure. That argument fails here for the same reasons stated above. Moreover, Kothari discloses reference to line pressure as well as flow rate, and Appellants never argue that disclosing flow rate fails to disclose the claimed quantity. *See* Kothari ¶¶ 50, 53; Final Act. 3; *see also* Appeal Br. 10 (suggesting interchangeability of "quantity" and "flow" in context of claim 1 argument). Accordingly, we sustain the rejection of claim 2.

Dependent Claims 7–9 and 14

Claim 7 depends from claim 1 and requires "wherein said second quantity is based on temperature in the electric motor as determined from a

resistance of windings in the motor." Claims App. 1. The Examiner relied on paragraph 49 of Kothari as disclosing the "resistance of windings in the motor" aspect of claim 7. Final Act. 4. Appellants argue that Kothari fails to disclose "determining temperature based on resistance of the windings" and merely suggests determining temperature "using sensors known in the art." Appeal Br. 11. We agree with Appellants. Kothari merely mentions sensors "known in the art," but does not disclose a specific placement for any sensors or otherwise suggest using "known" sensors to monitor the resistance of windings in the motor, as the claim requires, as opposed to monitoring some other portion of the motor or another known way of determining temperature. Kothari ¶ 49. We therefore do not sustain the rejection of claim 7.

Claim 8 depends from claim 7, claim 9 depends from claim 8, and therefore claims 8 and 9 contain the same limitations as claim 7. Claims App. 2. Claim 14 includes similar limitations to claim 7, including "measuring the resistance of windings of the electric motor" and "estimating the temperature in the electric motor based on the resistance." Claims App. 2. The Examiner made similar findings relying on Kothari in the rejection of claim 14, and in response Appellants made the same arguments raised with respect to claim 7. Final Act. 7; Appeal Br. 14. We do not sustain the rejection of claims 8, 9, and 14 for the same reasons discussed above with respect to claim 7.

Independent Claim 18

System claim 18 includes several limitations that parallel method claim 1, and also requires an "electronic control unit commanding the electric pump to continuously increase electric pump speed" under certain conditions. Claims App. 3–4. Similar to claim 1, the Examiner relied on the combination of Day, Kothari, and Bartolazzi in rejecting claim 18. Final Act. 4–5. In the appeal of claim 18, Appellants first rely on the same arguments made with respect to claim 1, and we reject those arguments for the same reasons discussed above in the context of claim 1.

Appellants also argue that Bartolazzi fails to disclose "continuously increasing pump speed" as required by claim 18. Appeal Br. 11–12. More specifically, Appellants argue that Bartolazzi discloses electric pump operation "controlled along curve Q for the lowest total power consumed by a pump 6 and electric fan 5 which is clearly different from continuously increasing pump speed as disclosed and claimed." *Id.* We agree that Bartolazzi discloses operation along a curve Q, but disagree that Bartolazzi fails to disclose continuously increasing pump speed when asked to do so based on demands of the system. Bartolazzi discloses initiation of an increase in power to the electric pump when triggered to do so (by engine temperature readings that are higher than a reference value. Bartolazzi 3:7–19. We agree with the Examiner that this increase in power will result in an increase in flow to the fluid circuit, a finding not contested by Appellants. Final Act. 5; Appeal Br. 11–12. This same passage from Bartolazzi discloses that, after the increase in power, the working point moves along the curve Q, meaning that if the engine temperature reading remains higher

than the reference temperature, the power to the pump will be increased again to meet the cooling demands of the system, i.e., continuously increased until the demands are met. Bartolazzi 3:7–19. The fact that Bartolazzi may seek to minimize total power consumed does not indicate that the disclosed system does not continuously increase the power to pump when necessary.

Based on the foregoing, we sustain the rejection of claim 18.

Claim 10

Claim 10 requires the step of "commanding an electric pump coupled to the fluid circuit to continuously increase flow to the fluid circuit until a lubricant quantity provided to the first component satisfies a desired lubricant quantity and a temperature in the second component satisfies a predetermined threshold temperature." Claims App. 2. The Examiner found that Kothari discloses the "commanding" step of claim 10, and equates satisfying "lubrication requirements" in paragraph 50 of Kothari with the "lubricant quantity" required by claim 10. Final Act. 6. The Examiner found that Kothari does not disclose "commanding an electric pump (110) coupled to the fluid circuit to continuously increase flow to the fluid circuit." *Id.* The Examiner found that "Bartolazzi discloses commanding an electric pump (6) coupled to the fluid circuit to continuously increase flow to the fluid circuit (by increasing the power supplied to the electric pump, C3, L7-19)." *Id.* The Examiner determined that it would have been obvious "to modify Kothari by further commanding an electric pump" to continuously

increase flow as claimed "to minimize the amount of power required to reject heat from the engine." *Id.*

Appellants argue that Kothari's electric pump seeks to maintain line pressure and, as such, does not disclose commanding an electric pump to increase flow until a certain quantify of lubricant satisfies a predetermined threshold. Appeal Br. 12. Similar to the argument with respect to Day, Appellants argue that Kothari's method of maintaining line pressure "does not inherently meet a required quantity or flow." *Id.* at 10. Appellants also assert that Bartolazzi fails to remedy the lack of teaching from Kothari. *Id.* at 12–13.

Appellants arguments with respect to claim 10 largely mirror those addressed above with respect to claims 1, 2, and 18, and fail to persuade us that the Examiner erred in the rejection of claim 10. First, as discussed above in the context of claim 1, the claimed "quantity" of claim 10, when read in light of the specification, can be met by a system such as Kothari's based on maintaining line pressure. Moreover, as discussed in the context of claim 2, Kothari discloses utilizing the flow rate within the system, not just line pressure, and Appellants never argue that disclosing flow rate fails to disclose the claimed quantity. *See* Kothari ¶¶ 50 (referring to "flow requirements" and "lubrication requirements"), 53 (discussing relationship between flow and pressure); Final Act. 6; *see also* Appeal Br. 10 (suggesting interchangeability of "quantity" and "flow" in context of claim 1 argument). Appellants' arguments have not adequately distinguished the method claimed in claim 10 and disclosed in the specification from that disclosed on Kothari in this respect. Appellants' arguments regarding Bartolazzi and the

alleged failure to disclose "continuously increasing" the pump speed have been addressed above in the context of claim 18. For the reasons stated above, we are not persuaded that the Examiner erred in the findings related to Bartolazzi.

Based on the foregoing, we sustain the rejection of claim 10.

Dependent Claim 15

Claim 15 depends from claim 10 and requires "commanding the electric pump to continuously decrease flow" under certain conditions. Claims App. 3. The Examiner relied on Kothari and Bartolazzi in the rejection of claim 15. *See* Final Act. 6–7. Appellants incorporate previously made arguments that Kothari and Day, alone or in combination fail to disclose the limitation of claim 15 because "Kothari teaches control of the pump based on line pressure and Bartolazzi teaches control of the pump to coordinate with control of an electric fan to reduce total electric power consumption." Appeal Br. 14. We considered these arguments above and found them lacking. Appellants do not make further arguments that are directed to the specific limitations and findings related to claim 15. Accordingly, we sustain the rejection of claim 15.

Dependent Claims 3, 5, 11–13, 16, and 20

Claims 3 and 5 depend from claim 1, claims 11–13 and 16 depend from claim 10, and claim 20 depends from claim 18. Claims App. 1–4. Appellants do not make separate arguments in support of these claims that go beyond the arguments made with respect to the respective independent

claims from which they depend. Appeal Br. 10, 12. Accordingly, we sustain the rejection of claims 3, 5, 11–13, 16, and 20 for the same reasons discussed above with respect to claims 1, 10, and 18.

DECISION

We affirm the decision of the Examiner to reject claims 1–3, 5, 10–16, 18, and 20 under 35 U.S.C. § 103(a).

We reverse the decision of the Examiner to reject claims 7–9 and 14 under 35 U.S.C. § 103(a).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART